

Invention: PROJECTION SYSTEM Applicant: Baoxin Li
 Filed: April 14, 2004 Attorney: Kevin L. Russell, Reg. No. 38,292
 Docket: 7146.0217 Telephone: (503) 227-5631

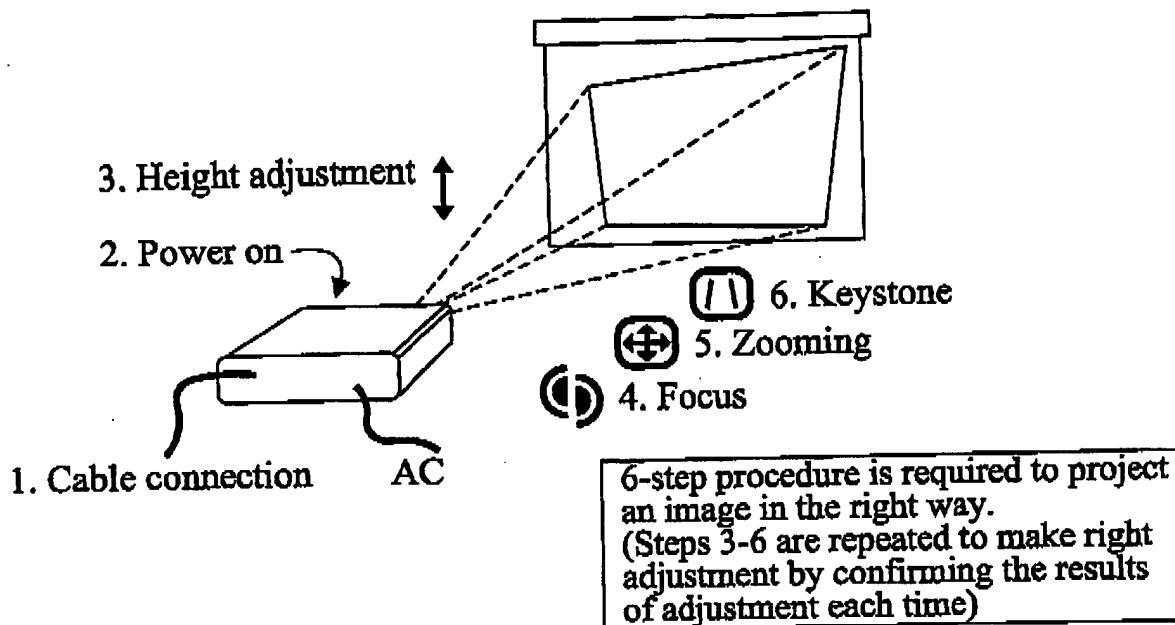


FIG. 1

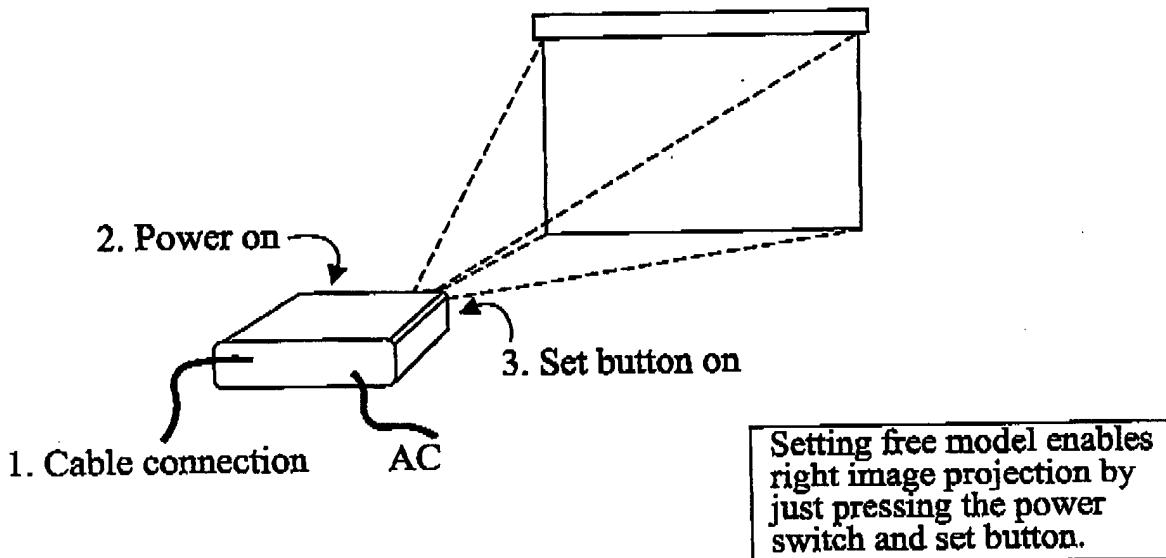


FIG. 2

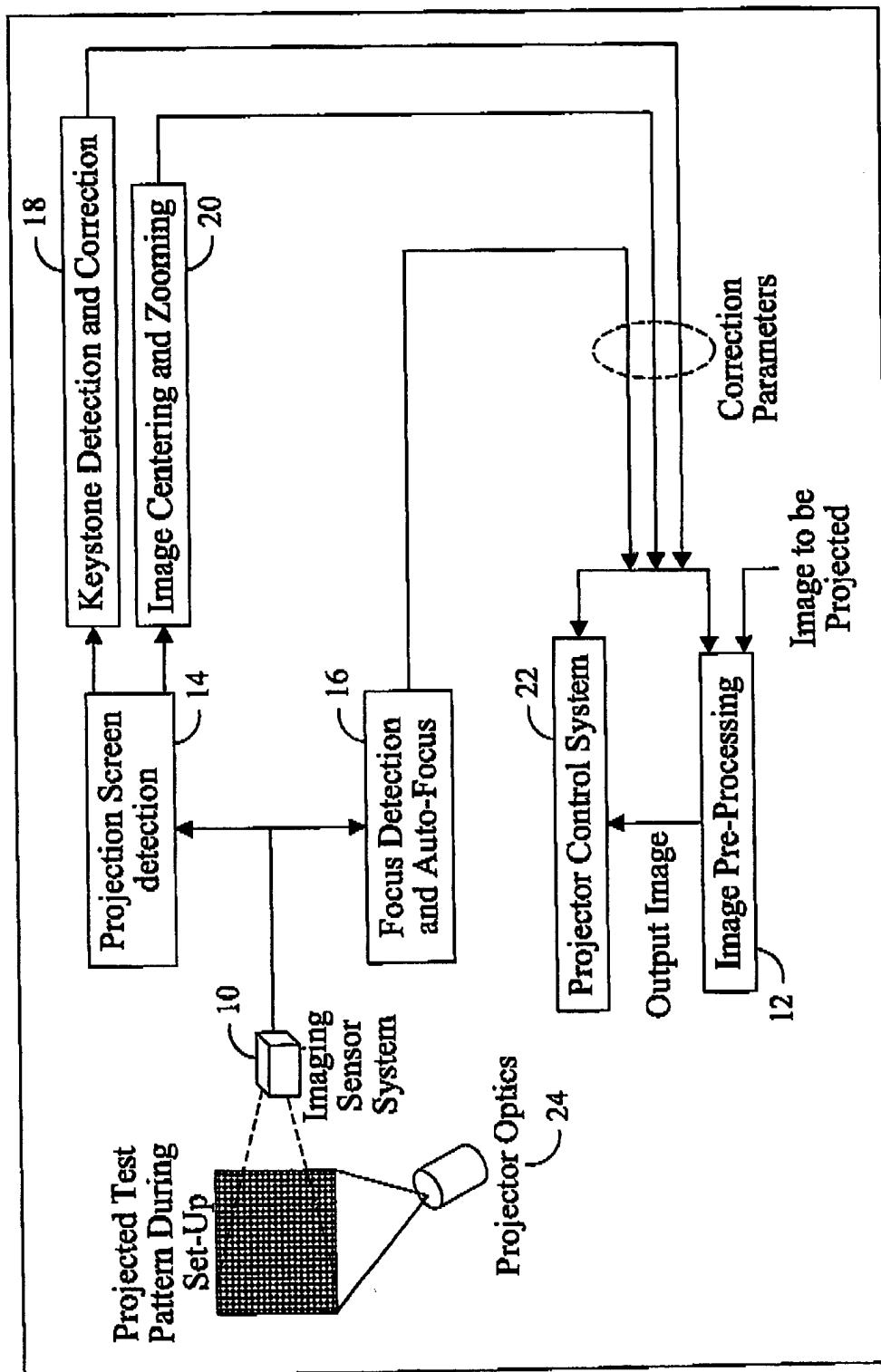


FIG. 3

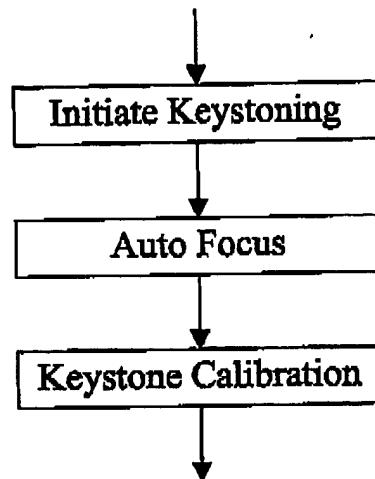
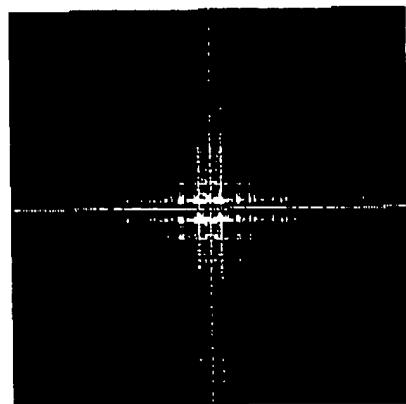


FIG. 4

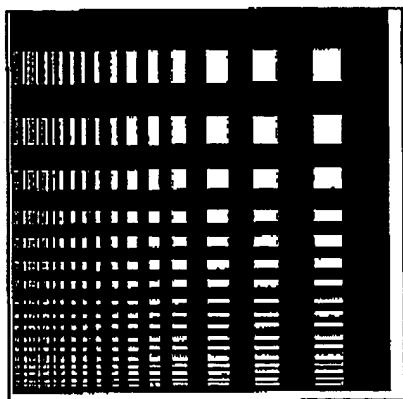
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FIG. 8



Spectrum

FIG. 5



Focused
Image

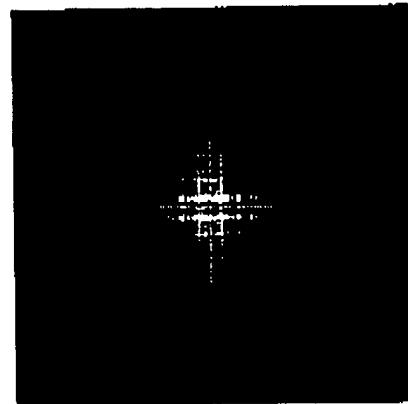
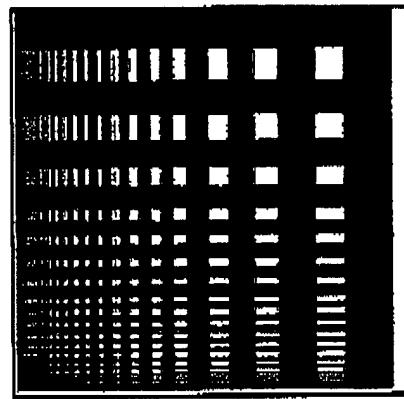


FIG. 7

Spectrum

FIG. 6



Out-of-focus
Image

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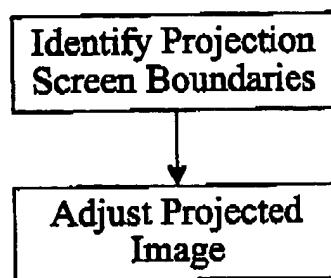


FIG. 9

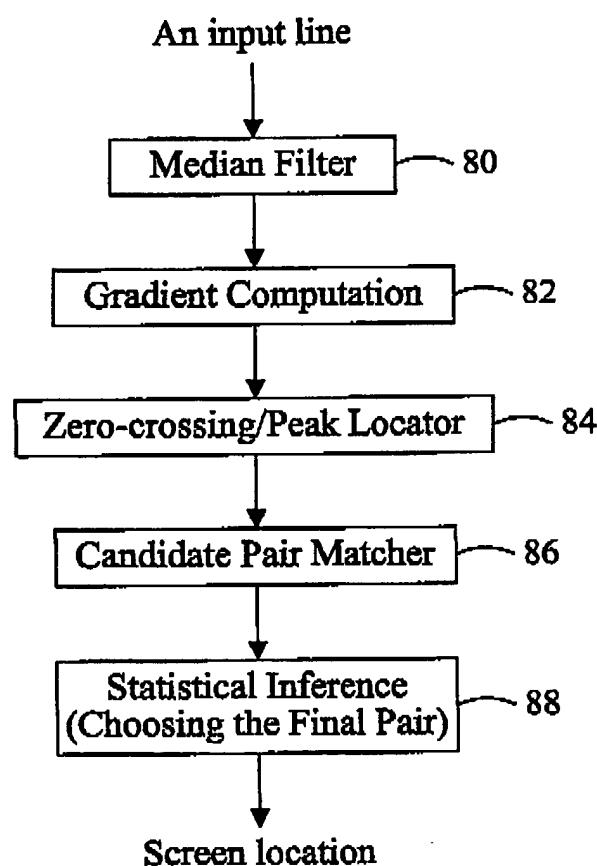
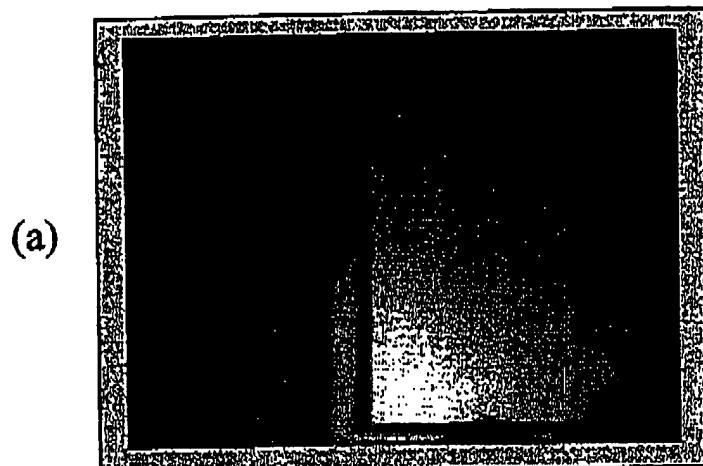


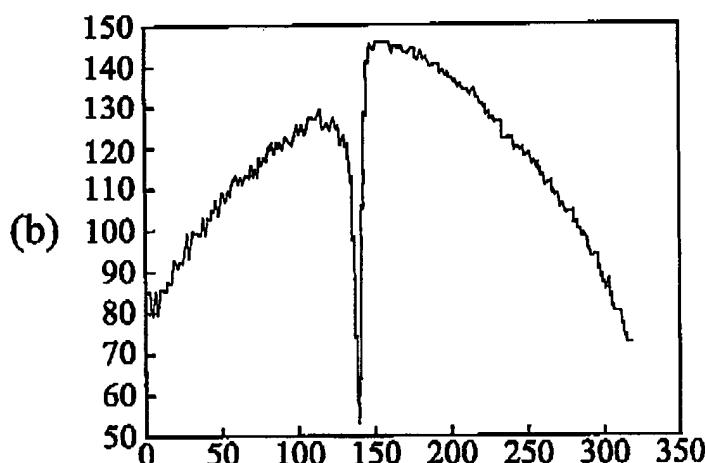
FIG. 10

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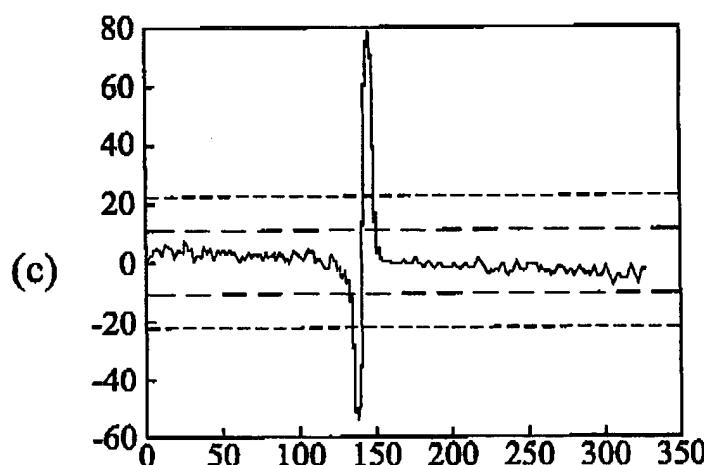
(a)

An image of the screen from the projector's perspective. The line is assumed to be the one row that the 1-D sensor can sense.



(b)

The luminance values of the row in (a), illustrating that working in the luminance domain there may be no region that is uniform (and thus is potential screen area).



(c)

The gradient of (b).

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FIG. 11

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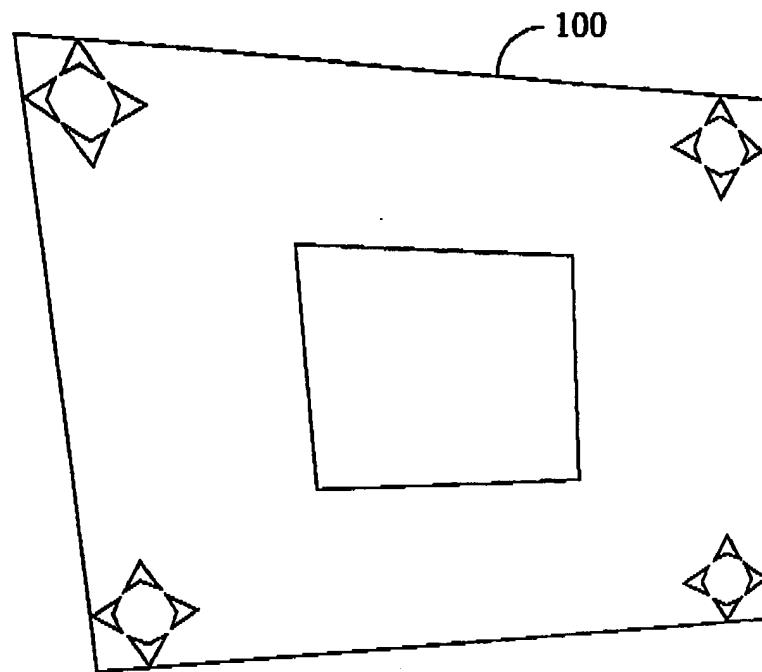


FIG. 12

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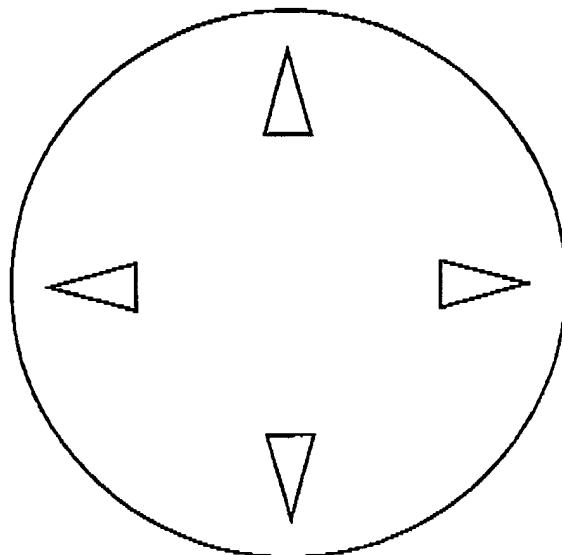
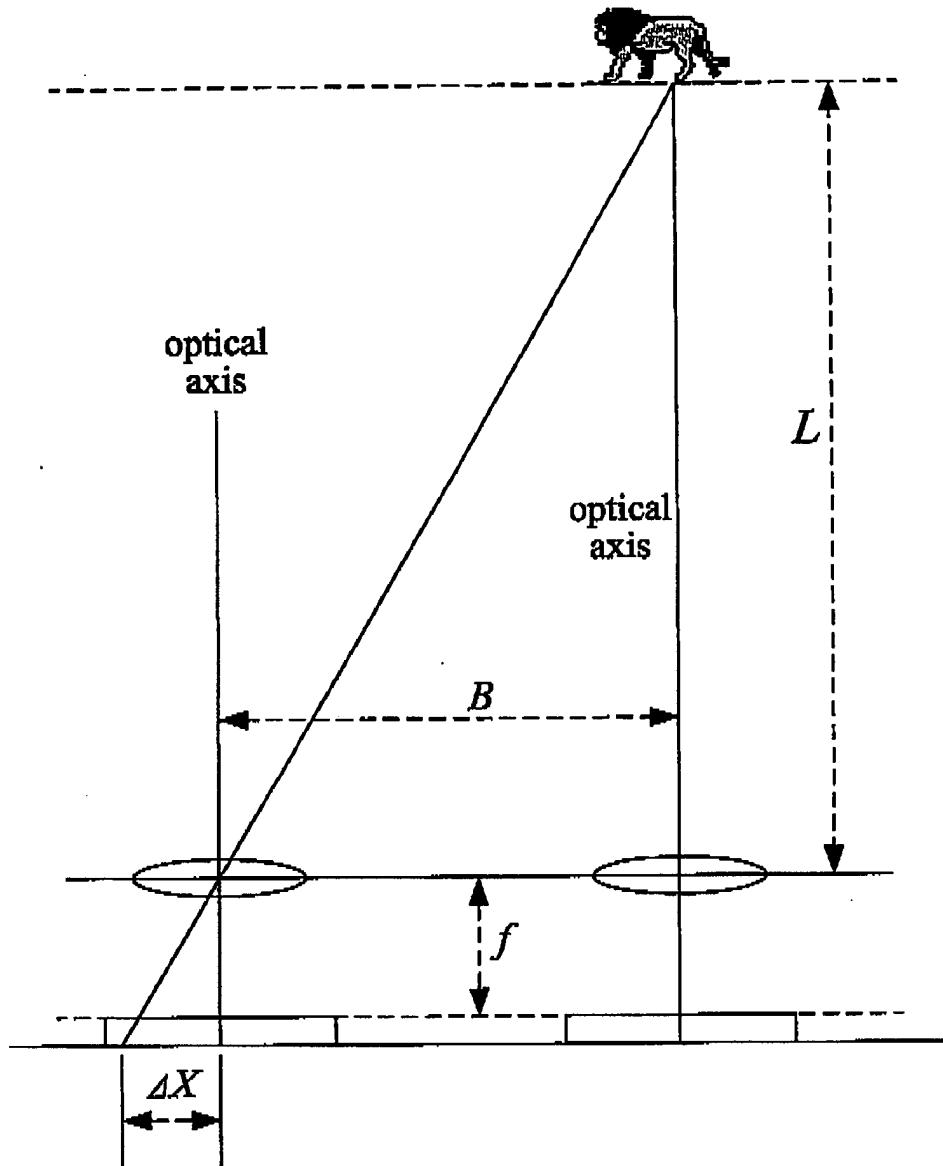


FIG. 13

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Based on the similarity of the triangles, the distance L is computed as a function of the sensor parameters (B and f) and the disparity ΔX (difference between the two images of the same physical point):

$$L = \frac{Bf}{\Delta X}$$

FIG. 14

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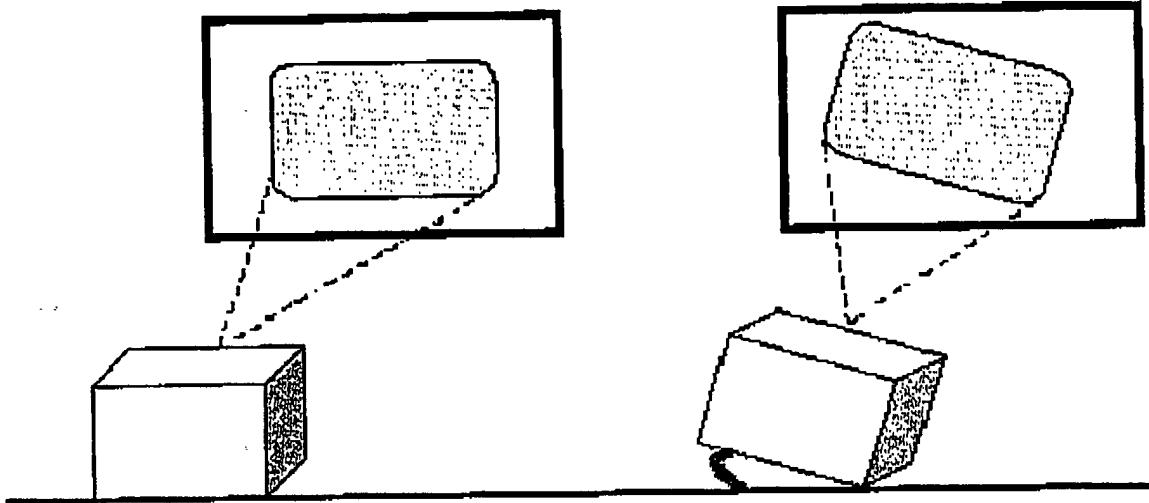


FIG. 16

FIG. 15

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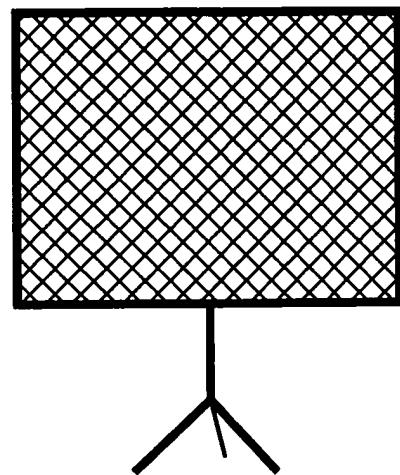


FIG. 17A

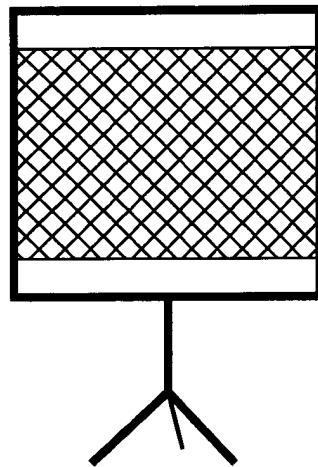


FIG. 17B

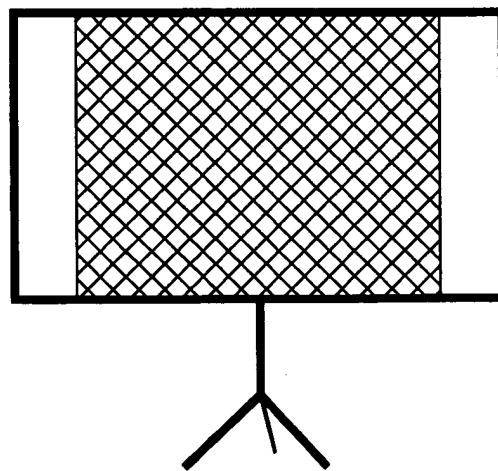


FIG. 17C

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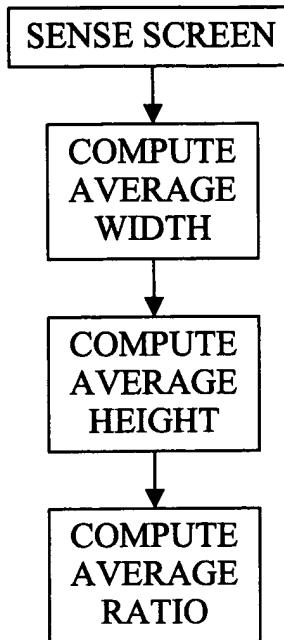


FIG. 18

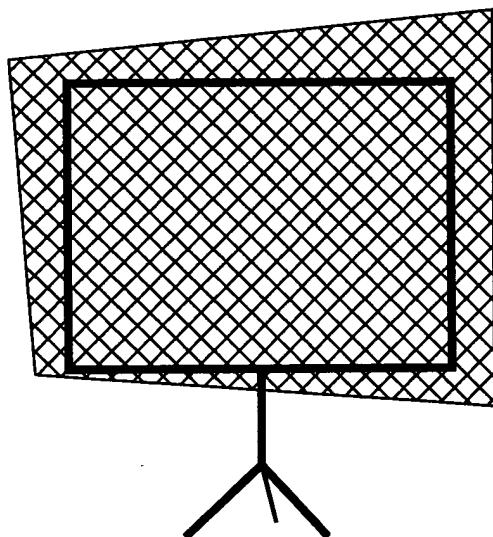


FIG. 19

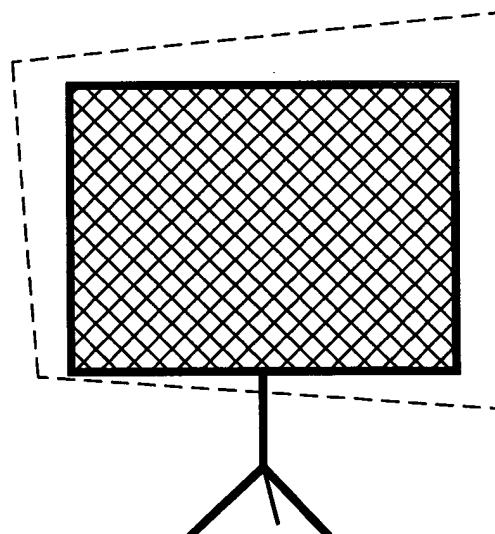


FIG. 20

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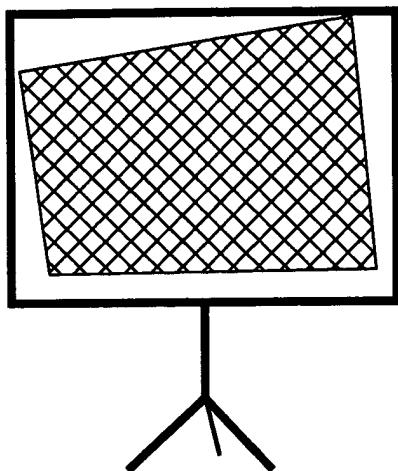


FIG. 21

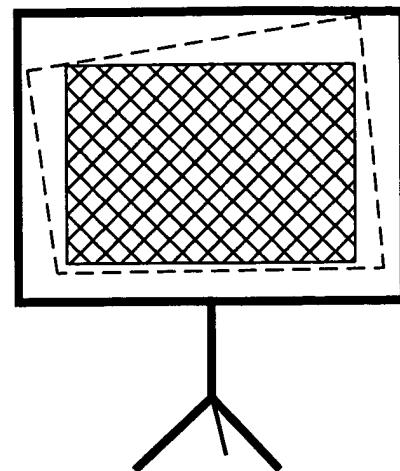


FIG. 22

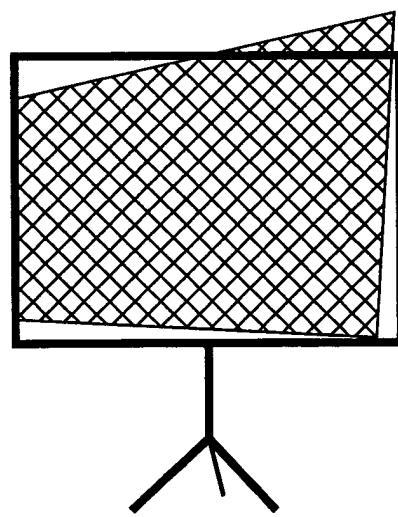


FIG. 23

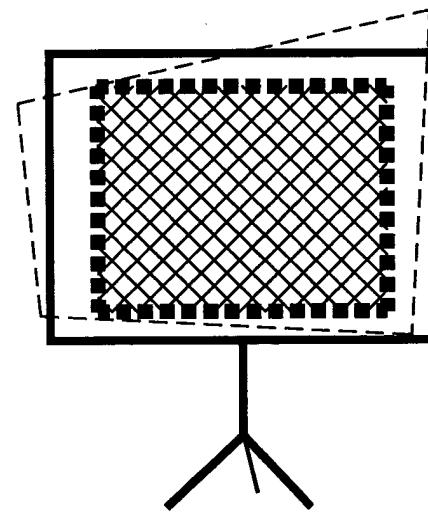


FIG. 24